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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,161	11/24/2003	Jyh Chain Lin		1160

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EXAMINER
DIACOU, ARI M

ART UNIT	PAPER NUMBER
3663	

DATE MAILED: 02/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/707,161	LIN ET AL.	
	Examiner	Art Unit	
	Ari M. Diacou	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 January 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 January 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

The responses to arguments listed below are in response to the remarks found on pages 7-14 of the applicant's submission filed 1-26-2006.

1. In response to the arguments about the drawings found on page 7, the examiner finds newly submitted figure 1 compliant. Regarding figure 2, the ordinate axis is labled ouput power, dBm is a measurement of gain, which begs the question, is it output power being measured, or the gain (presumably the ratio of output power at 1550 nm to the input pump power at 980 nm), which is being measured. This objection is not academic since dBm implies that the ordinate is measured logarithmically, while power is measured linearly. One skilled in the art would get different impressions of the scale of the device based on which units were used. Figure 2 stands objected to, and applicant is required to file new drawings.

2. Regarding the arguments towards the 35 USC 101 rejection on pages 7-8, the examiner has fully considered them but found them unpersuasive. The examiner understands that the device which is in possession of the applicant probably uses 980 nm radiation to pump a fiber which amplifies 1550 nm radiation (as described in the USPAP 2004/0105143). However, the claims say "the pump light is amplified by said fiber" [line 14 of amended claim 1]. This limitation is also recited in the specification. The

same limitation is what makes the device inoperable, since signal light is typically amplified, not pump light.

3. Regarding the 35 U.S.C. 112 first paragraph rejection, it still applies for the reasons cited above.

4. Regarding the argument that Falquier doesn't teach fiber 118' being an export path, the limitations in the applicant's claims which require that, are merely statements of intended or desired use, and do not structurally distinguish over the prior art.

5. Regarding the argument that Falquier fails to disclose the second isolator, Hecht teaches that deficiency as shown in the office action of 11-3-2005.

6. Regarding the 'ingenious' achievements of the applicant, the limitations to those contributions are recited in claims 3, 4 and 9, not in claims 1 and 6, and does not serve to distinguish claims 1 and 6 over the prior art.

7. Regarding the traversal of the rejection of claims 3 and 4 (as well as the addition of independent calim 9), the applicant's arguments have been considered but are moot in view of the new ground(s) of rejection, which has been necessitated by an amendment to claims 1 and 6 which change their scope.

Drawings

8. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because dBm is not a measure of output power as explained above. Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings.

The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Rejections - 35 USC § 101

9. Claims 1-12 are rejected under 35 U.S.C. 101 because the disclosed invention is inoperative and therefore lacks utility. The examiner and the prior art as a whole, are not aware of any mechanism by which a doped fiber may amplify light at the same frequency as the pumping light. The examiner cites Yan et al. (USP No. 5982973) [Col. 4, lines 26-40] for disclosing the normal erbium laser operation.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

11. Claims 1-7 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The applicant provides to one skilled in the art no mechanism by which a lanthanide-doped fiber can amplify light of the same frequency as the pumping radiation.

12. Claims 11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The applicant does provide a disclosure of what pumping wavelength to use with a Pr-doped fiber, nor what wavelength light will be output when it is pumped.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

16. As best understood by the examiner, claims 1 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the prior art disclosed in Fig. 4 of the instant application (or equivalently in view of Falquier et al. (USP No. 6429965)), and further in view of Hecht. Falquier discloses a broadband light source comprising:

- a pump laser for producing a pump light; [Fig. 14A, #100] [Col. 18, lines 35-54].
- An erbium-doped fiber having a predetermined length [Fig. 14A, #118'] [Col. 18, lines 35-54].
- a wavelength division multiplexer (WDM) device with at least three ports, first and second ports of said three ports respectively connecting with the pump laser and said fiber; and [Fig. 14A, #110'] [Col. 18, lines 35-54].
- a first optical isolator connecting with a third port of the WDM device [Fig. 14A, #124] [Col. 18, lines 35-54].

but fails to disclose a second isolator attached to the fiber at point 17. Hecht teaches that isolators are commonly used at the output of amplifiers in order to mitigate Brillouin scattering. Contrary to the disclosure by the applicant (stating that the end of the fiber 17 is treated to mitigate reflection), Falquier does not teach any peculiarities of the fiber 118', and we are to assume that outputted light is simply routed via fiber elsewhere.

Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to put an isolator at the output of fiber 118', for the advantage of reducing Brillouin backscattering.

17. Claims 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farquier in view of Hecht as applied to claim 1 above. Farquier and Hecht disclose the invention with all the limitations of claim 1 above, but in addition Farquier teaches:

- The broadband light source as described in claim 1, wherein said fiber is an erbium-doped fiber. [Fig. 14A, #118'] [Col. 18, lines 35-54]
- The broadband light source as described in claim 1, wherein the pump laser comprises a laser diode emitting light having a wavelength of 980 nm. ; [Fig. 14A, #100] [Col. 18, lines 35-54] [See Yan cited above for an explicit teaching of pumping with 980nm radiation]

Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to employ the limitations of Farquier, for the advantage of lower R&D costs.

18. Claims 3, 4, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Farquier in view of Hecht as applied to claim 1 above and further in view of Agrawal and Hwang (USP No. 6252700).

- On pages 55-56, Agrawal teaches the relationship between attenuation, power and length.

- On pages 226-228, Agrawal teaches the relationship between power, gain and length.
- On page 229, Agrawal teaches gain saturation.
- Hwang teaches the effect of length on isolation factor, and how an isolator will transmit and reflect different intensities of light based on where it is placed in a system.
- Agrawal teaches in 6.4.4 and 6.4.5 that the relationship between power and distance is a linear one that obeys the principle of superposition.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to simply add the effect of reflected/transmitted power due to the placement of the isolators and then solve the system of linear equations, to obtain a plot of distance versus gain/output power, as was done by Agrawal in fig 6.16. The applicant expressed that the object of the "present invention may seem obvious once the problem is identified and utilized." Hwang has identified the problem of amplifier gain as a function of isolator placement, and Agrawal provides a utility for solving the problem at hand. Therefore, it would have been obvious to one skilled in the art (e.g. an optical engineer) at the time the invention was made, to modify the structure taught by Falquier and Hecht by altering the fiber lengths so that the output power's from the isolators were equal, for the advantage of having a single pump source for two amplifiers which one desired to have the same pump power at all times.

19. Regarding claim 12, the parent claim being rejected over Farquier, Hecht, Agrawal and Hwang above, Hwang and Farquier further discloses doping the fiber with erbium.

Conclusion

20. While patent drawings are not drawn to scale, relationships clearly shown in the drawings of a reference patent cannot be disregarded in determining the patentability of claims. See In re Mraz, 59 CCPA 866, 455 F.2d 1069, 173 USPQ 25 (1972).

21. The references made herein are done so for the convenience of the applicant. They are in no way intended to be limiting. The prior art should be considered in its entirety.

22. The prior art which is cited but not relied upon is considered pertinent to applicant's disclosure.

23. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ari M. Diacou whose telephone number is (571) 272-5591. The examiner can normally be reached on Monday - Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AMD 2/3/2006

JACK KEITH
SUPERVISORY PATENT EXAMINER